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CITIZENS VOICE

DEP drilling records reveal water damage

State environmental regulators determined that oil and gas development damaged the water supplies for at least 161 Pennsylvania homes, farms, churches and businesses between 2008 and the fall of 2012, according to a cache of nearly 1,000 letters and enforcement orders written by Department of Environmental Protection officials and obtained by The Times-Tribune. The determination letters are sent to water supply owners who ask state inspectors to investigate whether oil and gas drilling activities have polluted or diminished the flow of water to their wells. Inspectors declared the vast majority of complaints - 77 percent of 969 records - unfounded, lacking enough evidence to tie them definitively to drilling or caused by a different source than oil and gas exploration, like legacy pollution, natural conditions or mining. One in six investigations across the roughly five-year period - 17 percent of the records - found that oil and gas activity disrupted water supplies either temporarily or seriously enough to require companies to replace the spoiled source. The letters confirming contamination or water loss from drilling and the orders that require companies to fix the damage provide what is likely the best official count of the industry's impact on individual water supplies in Pennsylvania because the state does not track the disruptions. The Times-Tribune requested the records in late 2011, and received access to them late last year after a state appeals court ruled that the DEP had to release the documents regardless of whether it was hard for the agency to find them in its files. While the records compiled by the newspaper offer a more complete tally of the number of affected properties than was previously available, the count is not exhaustive: DEP tracks oil and gas-related disruptions to water supplies based on broad incidents, each of which might affect one or many water supplies, making comparisons between the totals difficult. A case of gas migrating into Dimock Township drinking water, for example, is considered one incident by DEP even though the state determined it affected 18 water wells used by 19 families. DEP spokesman Kevin Sunday said the agency compiles "some information" on the number of affected water wells and springs, but DEP's statistics on impacted water supplies differ from the numbers documented in the letters and orders released to The Times-Tribune. Between 2010 and 2012, DEP counted 103 impacted water supplies - six more than were documented for those years in the records released to the newspaper. DEP repeatedly argued in court filings during the open records case that it does not count how many determination letters it issues, track where they are kept in its files or maintain its records in a way that would allow a comprehensive search for the letters, so there is no way to assess the completeness of the released documents. Before a 2011 regulatory update, solutions worked out privately between homeowners and drillers were not required to be reported to the department. The Times-Tribune requested the notices of potential water contamination that now have to be passed on to DEP by drilling companies that receive them from residents, but the request was denied by DEP and the state's Office of Open Records because the documents are considered part of protected investigations. n The conclusions described in the determination letters are seldom absolute because substances read as signals of drilling-related contamination are also routine signs of other man-made or natural influences. For regulators, tracking broad cases is more useful from a technical standpoint than counting impacted water wells, Sunday said in an email. "The number of water supplies impacted is not always reflective of the scope of the problem," he said. Using its definition of incidents, DEP counted 83 cases of drilling-related impacts on water supplies between 2008 and 2012, roughly the same period as was covered by the records released to The Times-Tribune. The state has confirmed water supply impacts in 128 broad cases since 1987, he said. The state's case-based tally suggests the rate of drilling-related contamination incidents increased with the start of the Marcellus boom: Drilling damaged water supplies at a rate of more than 16 cases per year during the last five years, according to the state's accounting. For the 20 years prior to 2008, the incidence rate was fewer than three cases per year. Sunday said the increase can be attributed to a shift from drilling in western areas of the Commonwealth with a long history of oil and gas extraction to central and eastern regions where the shallow geology is complex, gas-rich

and less studied. Those factors mean "that there will be an adjustment period during which operators refine casing and cementing practices in order to most effectively establish and maintain the highest standards of well integrity," he said. The most recent trends - DEP counted five contamination cases that impacted roughly 19 water supplies in 2012 compared to 18 cases that impacted 27 water supplies in 2011 - suggest that the improvements are working, he said. The department's water testing and reporting protocols have come under scrutiny in recent months as environmental activists and homeowners whose drilling-related complaints were dismissed have come to doubt the determinations' accuracy and value. DEP recently changed its policy for issuing water contamination notices to require administrators in Harrisburg to approve them before they are sent out from the regional field offices that conduct the investigations. The state's laboratory technical director, deposed when a resident appealed the DEP's conclusion that drilling activities had not polluted his water supply, acknowledged that DEP reviews and reports back to homeowners only those contaminants it considers indicative of drilling-related contamination, not all of the contaminants that might surface in its water tests - a common practice for tailoring laboratory analysis but one that spurred critics to question the thoroughness and transparency of DEP's investigations. In January, state Auditor General Eugene A. DePasquale announced his office is conducting a performance audit of the DEP's water testing program to "determine the adequacy and effectiveness of DEP's monitoring of water quality as potentially impacted by shale gas development activities" between 2009 and 2012. Debate over the safety of oil and gas extraction - especially the combined tools of horizontal drilling and hydraulic fracturing used in pursuit of fuel from unconventional sources like the Marcellus Shale - is often characterized as an argument between activists who exaggerate claims of damage and industry public relations teams who minimize them. But the determination letters released by the state reveal a widespread suspicion among water supply owners - farmers and summer residents, school board members and mini-mart operators, churches and a Wyoming County municipal water authority - that when their water seems soured, gas drilling operations might be to blame. According to the state's records, they are sometimes right and for myriad reasons. More than half of the records of contaminated water supplies confirmed by the state involved gas, loosened by drilling, seeping into drinking water aquifers. Faulty natural gas wells channeled methane into the water supplies for 90 properties, the letters show. Three of those cases were tied to old wells, one of which caused an explosion at a home after gas entered through a floor drain and accumulated in a basement. Drilling-related road construction contaminated water at two homes, while construction for a large water-storage pond called an impoundment contaminated another. Pipeline construction twice polluted water supplies with sediment. Stray cement or rock waste displaced by drilling, called cuttings, contaminated seven water supplies. The state has never implicated the underground gas extraction process known as hydraulic fracturing, or fracking, in a contamination incident, but inspectors noted that brine contamination suggesting "an infiltration of frack water into the shallow ground water," damaged six fresh-water springs used for drinking water in northwestern Pennsylvania. Some of the problems were short-lived: the DEP letters describe 20 of the confirmed contamination incidents as temporary. The incidents documented in the letters reinforce why the state and industry have focused on strengthening standards for above-ground activities so materials don't infiltrate the surface and well construction to ensure the cemented casings that protect groundwater are sound, Marcellus Shale Coalition CEO Kathryn Klaber said. The natural gas industry has worked on several fronts to investigate and respond to contamination complaints, including providing drinking water to homeowners while their concerns are investigated, she said. The organization and university partners are also compiling a database of pre-drilling groundwater quality to help researchers assess background water quality and insulate operators from misplaced blame. The letters obtained by The Times-Tribune describe an array of problems that exist in Pennsylvania water supplies unrelated to oil and gas exploration, like high metal, salt and methane content and bacteria from surface water or nesting creatures invading poorly built water wells. A 2011 Penn State study found that about 40 percent of water wells it tested prior to gas well drilling failed at least one federal drinking water standard, usually for coliform bacteria, turbidity or manganese. Pennsylvania is one of only a few states in the nation that does not have private water well construction standards. "It really is time for Pennsylvania to put in place some standards for private water wells," Klaber said. Regulations could help address pre-existing water quality problems and make sure water wells are stable enough to handle any nearby industrial activity, including oil and gas operations, she said. "When you've got vibration and activity proximate to an unlined water well you're going to get infiltration of dirt and other materials. That turbidity, usually temporary, is going to affect that water." Indicators of drilling-related contamination might equally point to past pollution or natural systems changing with weather or seasons, so the contaminants DEP cites as evidence of a drilling impact in one letter can be cited as evidence of background water conditions in another. Manganese, iron and a measure of the salts and minerals dissolved in the water known as total dissolved solids (TDS) are among the elevated parameters most frequently noted by DEP inspectors in water wells they determined were not influenced by drilling, but in at least 30 cases where the DEP

determined that oil and gas drilling had contaminated water supplies, increases in manganese, iron or TDS were described as a primary or sole indicator of a problem. Letters sent to nine McKean County homeowners during an involved investigation of drilling-related contamination captured the difficulty of drawing conclusions based on substances that can indicate both normal conditions and harm: "An elevated level of these compounds is not uncommon in this region and can occur naturally," the investigator in the case wrote, "but it is also recognized that they can become elevated as a result of drilling oil and gas wells." DEP does not rely only on water test results to determine whether a water supply was affected by drilling, Sunday said. "We employ a very complex analysis in these investigations." Inspectors "consider things like local water well and gas well integrity, a geochemical evaluation of the water supply, and the local rock formations and how water flows through them," he said. In many cases, the failure that led to contamination is left as opaque as turbid water. DEP blamed a Marcellus Shale driller in Susquehanna County for water contamination in 2010 after the salt, barium, strontium and gas concentrations in the Rush Township home's water supply spiked after the company drilled and fracked a well 600 feet away. The post-drilling barium levels reached 47 milligrams per liter - more than 23 times the safe level of the toxic metal in drinking water - while the TDS, chloride and sodium levels peaked at more than 10,800, 5,800 and 3,800 milligrams per liter, respectively - more than 20 times the guidance levels set for aesthetic reasons like taste and appearance. The determination letter and the subsequent order requiring the driller, Stone Energy, to replace the water well do not describe the mechanism for the pollution. Instead, Sunday said, the company was presumed responsible for the contamination based on the timing of the impact and the distance from the gas well and the company did not rebut the state's finding. Stone Energy believed its drilling activity was not to blame for the pollution, but agreed to drill the homeowner a new water well and repay him for out-of-pocket living expenses without admitting to causing the problem, according to the enforcement order. High TDS, chlorides, sodium, barium and strontium - all potential signatures of contamination from Marcellus development wastewaters - "also occur in brackish or saline groundwater which have been documented at relatively shallow depths in this part of the state," Sunday said. Although the concentrations of those elements surged to levels between 46 and 142 times the pre-drill concentration measured on the property, the post-drilling samples were taken from a different, deeper water well and so could have been affected by the shallow brine. Critics of natural gas drilling say the ambiguity left by DEP investigations means the state needs more robust tools and a stronger will to pursue clues about contamination to its source. Anthony Ingraffea, Ph.D., an engineering professor at Cornell University and a vocal critic of the oil and gas industry he once worked for, said that when DEP says it cannot find a connection between water well contamination and nearby gas activity it does not mean there is no link. "If DEP sent me a letter that said, 'We can find no connection,' my natural question as a scientist would be, 'How did you look?'" he said. He was concerned by DEP's practice of counting cases without counting individually impacted water supplies, which he said "makes their statistics look better." "It doesn't help answer the question, which is how many individual families' private drinking water wells have been contaminated by oil and gas activities," he said. "No one knows the answer. Who should know the answer? DEP."

STATE IMPACT PENNSYLVANIA

Marcellus Shale Booster Calls for More Transparency

Penn State geologist Terry Engelder, who helped propel the state's shale gas boom by revealing how much natural gas lies trapped within the Marcellus, says the industry would be better off with more disclosure. Speaking to Gas Rush Stories producer Kirsi Jansa after a panel discussion on the lack of openness at the Pennsylvania Department of Environmental Protection, Engelder says resources should be spent on making the DEP more transparent. Check out the video below for more.

WASHINGTON POST

Energy Department approves expanded LNG exports

The Energy Department gave a terminal near Freeport, Tex., permission Friday to ship liquefied natural gas to Japan, providing a new outlet for rising U.S. production of shale gas despite qualms of environmentalists and many domestic manufacturers. The permit marks another step in the sudden reversal of fortune in the natural gas business. Less than five years ago, anticipating a worsening shortfall in domestic supplies of natural gas, the Freeport terminal on Quintana Island began operations as an import facility. But advances in hydraulic fracturing techniques have unlocked new supplies of natural gas from shale rock. Freeport, like other import terminals, now wants to spend $10 billion to retool the terminal so it can send gas abroad in liquefied form. Japan, with virtually all of its nuclear power plants shut down, is paying extremely high prices for energy imports and is looking for new supplies. Osaka

Gas and Chubu Electric agreed to buy all of the liquefied natural gas, or LNG, from the first of three phases of the Freeport export project for 20 years. The facility was conditionally authorized to export at a rate of up to 1.4 billion cubic feet of natural gas a day. It was the second permit given by the Energy Department for LNG exports to a country that does not have a free trade agreement with the United States. The department said it weighed economic, energy security and environmental considerations as well as nearly 200,000 public comments. The issue of whether to export natural gas has been controversial. Producers of natural gas and supporters of free trade have urged the Obama administration to approve LNG export facilities. But environmentalists fear that it will provide incentives for a new wave of drilling in places such as Pennsylvania. Moreover, domestic manufacturers, especially those from the petrochemical industry which uses natural gas as a raw material as well as an energy source, oppose substantial exports of natural gas. They say the surge in gas supplies and the modest prices for natural gas give the United States a competitive advantage that will revive industry and create more value than would be gained from exports. Dow Chemical, one of the leading voices opposing widespread exports, also owns a share of the Freeport terminal through a subsidiary. On Friday, it issued a statement calling the Freeport permit "a prudent step in pursuit of a measured and balanced approach" to LNG exports while adding that it "will adopt a wait and see approach regarding further approvals." In an interview, Peter A. Molinaro, Dow Chemical's vice president of federal and state government affairs, said that the company was worried that a combination of retirements of old coal-fired power plants and new industrial plants (including one of its own) between 2016 and 2020 could push natural gas prices sharply higher. "We are the voice of the consumer, and we plan to continue to be," Molinaro said. Natural gas prices recently hit a 20-month high after an unusually cold March. The benchmark Henry Hub spot price averaged $4.17 a thousand cubic feet in April, the highest monthly average price since July 2011, according to the Energy Information Administration. The EIA forecasts that natural gas production would increase from 69.2 billion cubic feet a day in 2012 to 70.1 billion cubic feet a day in 2014. According to a new Barclays report, if all of the other 14 terminals seeking Energy Department export permits were approved, their total capacity would amount to 28.7 billion cubic feet a day. Senate Energy and Natural Resources Committee Chairman Ron Wyden (D-Ore.) said that the Energy Department "will be making export decisions on a case-by-case basis" in a way that is "consistent with my belief that a measured approach on exports will provide the greatest advantage for the U.S economy." Wyden said the department should "assess the market impacts of each export decision after it is announced, to ensure American consumers are not harmed by large-scale exports." "This decision is a victory for those who believe free trade is good for the American economy," said the committee's ranking Republican member, Sen. Lisa Murkowski (Alaska). The Freeport terminal is half owned by ConocoPhillips and half by a group of four limited partners headed by chief executive Michael Smith. The department granted the first authorization to export 2.2 billion cubic feet a day of LNG to non-free-trade countries in May 2011 for the Sabine Pass LNG Terminal in Cameron Parish, La. The Freeport facility already had received permission to ship LNG to countries with free trade agreements.

PARKERSBURG NEWS AND SENTINEL

'No easy answers' to bass dying in Susquehanna, researcher says

When it comes to the health of the Susquehanna River, the Pennsylvania Fish and Boat Commission and the Department of Environmental Protection don't agree on much. But they do agree that smallmouth bass are dying at an epidemic rate, and Vickie Blazer, a biologist from the U.S. Geological Survey, is perhaps the best person to find out why. Earlier this month, Blazer was in Harrisburg for a forum on the health of the river the night before the federal Environmental Protection Agency ruled that the lower Susquehanna is not an impaired river. "Rivers are complex. Rivers are not easy." - Fish and Boat Commission biologist Geoff Smith. Rather, the federal agency said, the dying bass make it impossible to make a determination without more study. That was DEP's recommendation. The Fish and Boat Commission wanted the more aggressive impairment designation, arguing it would spur state and federal action sooner. This spring, Blazer sampled bass on the river, though some days there were so few fish it became hard to conduct the work. This summer, she will return to study the spawn class. In her presentation, Blazer outlined all of the physical problems that have besieged bass in the Susquehanna since 2005:

Small raised legions,

Benign skin tumors,

Fungal infections,

Heavy parasite loads,

Eggs growing in male sex organs,

Males having the protein that is a precursor for egg yolks.

During that bombardment, the Susquehanna went from one of the best smallmouth fisheries in the world to a river where anglers can't legally catch fish for months at a time. Sampling has shown that 99 percent of bass are more than a year old — which is no way for a species to survive. The bass' immune systems are so weak, Blazer said, "these fish are getting infected by whatever is in the water." And the research so far suggests a lot of "whatever" is in the water:

Too much phosphorus,

Too little dissolved oxygen,

Too much nitrogen,

Too many parasites,

Too many hormones acting as endocrine disruptors.

The water also has been too low at times. Often, it has been too warm, which could continue as climate change continues. Different stressors might be causing different problems, Blazer said. So far, Blazer has stayed away from the impairment debate. But she is adamant that no one policy change or preventative measure is going to suddenly save the bass. "There are no easy answers," Blazer said. "I think we all contribute. To focus on one source or another is not the way to go." John Arway, director of the Fish and Boat Commission who has lead a public campaign against DEP for more than a year, understands that, but he also wants to do "something." His preferred something is immediately reducing the amount of phosphorus in the river by dramatically accelerating the pollution diet the state is on schedule to implement by 2025 in its role cleaning up the Chesapeake Bay. If the bass keep dying after that, try something else. If nothing else, the river will probably be healthier without the extra phosphorus. That was the main point of a Chesapeake Bay Foundation study released last month — a study in which Arway was quoted. DEP, as it has noted before, says the problem is not that simple. Cutting the amount of phosphorus to reach the bay has an economic impact on Pennsylvanians, said DEP spokesman Kevin Sunday. The state has pushed hard to improve the water quality in the Susquehanna and the bay in recent years, Sunday said. The state is on pace to meet the goals required by the federal government. To push any harder would be unreasonable, Sunday said, especially if researchers don't know if such limits would truly help the bass. And that is really the crux of the argument. "It seems like DEP wants to be absolutely certain that if it jumps to a solution, it will fix the problem," Arway said. "I don't think anyone can say if we removed all the phosphorus and nitrogen from the river, the fish would all get better, but it would make the river better and it would make the Bay better." By law, DEP says, it can't institute new, region-wide regulations without knowing what the effects would be, both positive and negative. Arway is also disappointed that the EPA did not set a deadline for declaring the river either impaired or not impaired. Its ruling also didn't include a strict definition for how DEP should determine if the river is impaired. DEP has used a few key measurements, such as dissolved oxygen levels, and macroinvertebrate life to determine if the river should be impaired. The Fish and Boat Commission has argued that bass health should be factored into the equation as well. Since the Susquehanna doesn't meet DEP's current standards, but DEP and the EPA say more study is needed to determine if the river is impaired, Arway said everyone needs to know what results would change the agencies mind. "I thought we'd at least get a deadline from the EPA," Arway said. "We've been studying the river for years now … we need to have a deadline and a guide for measuring if the river is improving or not." Under the new "not enough information" classification, DEP has agreed to continue intensifying its studying of the river and create a fish health index. Arway counters that fish health indexes require a great deal of data, and there is no guarantee when it will be finished or if it will be used as a tool to determine if the river should be declared impaired when it is up for review in 2016. DEP also has moved some of its river monitoring stations, so they will be located with Fish and Boat's monitoring stations. Some of those stations will be in shallower water than DEP has tested in the past, where young

bass live. Temperatures can be more violative in shallow water, Geoff Smith, a biologist for Fish and Boat, said it's a necessary step toward gathering better data. With funding tight for most types of research, the two agencies need to continue working together. Because the Susquehanna is so wide, researchers have found researchers have found that it often acts like three distinct streams of water flowing through it. Each of those streams have different pockets, affected by depth, aquatic life and new water entering from creeks. That's part of what makes this problem so hard to solve, Smith said. Smith agreed with Blazer's assessment that there is no quick fix. "Rivers are complex," he said. "Rivers are not easy."

BALTIMORE SUN

Agencies aim to restore bay's depleted oysters, a creek at a time

It's planting time in the Chesapeake Bay, just as it is on land for farmers and gardeners across Maryland. Instead of seeds, though, hundreds of millions of speck-sized baby oysters — known as spat — are being planted this spring in Harris Creek, where it's hoped they'll grow and multiply. The Eastern Shore waterway is ground zero for an ambitious experiment — a multimillion-dollar gamble, actually — to see if the bay's depleted oyster population can be restored, one creek and river at a time. In the process, the effort just might help clean up and revitalize the bay. "It's not the solution, but it can be a part of the solution, and potentially a pretty big part," said Michael D. Naylor, chief of shellfish programs for the Maryland Department of Natural Resources. Once so chock-full that Native Americans called it "great shellfish bay," the Chesapeake has long since seen its oyster population decimated by overharvesting, pollution and disease. Annual harvests from Maryland waters that peaked at 15 million bushels in the late 1800s dwindled to fewer than 30,000 bushels a decade ago, idling watermen and shuttering shucking houses. Harvests rebounded some of late, but nowhere near the catch of old. Ecologically, the decline has been devastating. The bivalves were once so abundant they filtered all the bay's water in a few days as they fed on algae. Though scientists estimate hundreds of millions of oysters survive throughout the estuary, the population is spread thin and remains just 1 percent what it was believed to be in the early 1800s. State and federal officials are trying to turn that around in Harris Creek, an offshoot of the Choptank River near St. Michaels and the first of 20 bay tributaries in Maryland and Virginia to be targeted for large-scale restoration. Maryland and federal agencies have labored to restore oysters around the bay for more than a decade, with mixed results because of what Naylor called "scattershot" efforts. This time, he added, "we're putting all our eggs in one basket" before trying elsewhere. Harris Creek is a good place to start, Naylor said, as surveys indicate it's already got one of the bay's healthier oyster populations. For years, it was a popular spot for watermen, but since 2010 has been off limits to commercial harvest, part of a large-scale expansion of sanctuaries in Maryland. "If you can't restore Harris Creek," Naylor said, "you're going to have a very difficult time trying to restore an area that was worse to begin with." Starting last year, the Army Corps of Engineers, the National Oceanic and Atmospheric Administration and Maryland's DNR teamed up to build 22 acres of underwater reefs in the creek, providing a plateau on which oysters can grow. They laid down a layer of granite rocks, topped with empty clam and oyster shells, to provide hard surfaces to which wild oyster larvae might attach. Finally, to give nature a boost, the nonprofit Oyster Recovery Partnership "planted" more shells with an estimated 450 million spat already settled on them. A hatchery run by the University of Maryland at Horn Point in Dorchester County produced them. Rebuilding the reefs is critical to ensuring the survival of all those new oysters. Newly spawned larvae need to attach themselves to a hard surface such as another shell or a rock. Between shore erosion and sediment runoff from building sites in the bay watershed, officials estimate that more than 80 percent of the bay's reefs have been lost in the past 25 years under a thick layer of silt and mud. One day last week, 6,400 tons of clam shells barged down from New Jersey were spread on Harris Creek's bottom, using satellite navigation to pinpoint where the load would go. Not far away, over one of the reefs built last year, the oyster partnership's vessel used a hose to spray 1,400 bushels of oyster shells overboard carrying an estimated 27 million spat to the bottom. In all, the agencies and the partnership plan to deposit 390,000 tons of granite and old shells at various places on the creek bottom. When they're done, they hope to have 377 acres of thriving shellfish communities in waters they figure had just three acres' worth before they began. The mammoth undertaking has a price tag to match. Officials estimated it would cost $31 million to complete, including paying the university's hatchery to produce up to 2 billion baby oysters for seeding the bars. But the new reefs received an unexpectedly healthy gift of spat from the creek's existing oysters last summer, which ought to save some on buying hatchery oysters, said Stephanie Westby, NOAA's oyster restoration coordinator. "Nature smiled on us last year, we're not totally sure of the extent of it yet," she said. Even in a time of tight budgets, state and federal agencies have made funding the project a priority. But it still faces challenges, including finding enough old shell to build the reefs. Shell has been trucked in from as far away as Louisiana, adding to the cost. Officials also find they

need to rebuild reefs closer to shore than originally planned, because there just aren't enough good spots in deeper water. But the change is meeting resistance from local watermen, Naylor said, who aren't happy with the project. Jim Mullin, executive director of the Maryland Oystermen Association, said watermen are bothered by the "astronomical price," and because one of the state's more productive areas is off limits to harvesting. Still, the state's battered oyster industry has benefited from the same favorable weather the past few years that has boosted restoration efforts. Watermen hauled in about 300,000 bushels during the last season, according to preliminary estimates, their biggest wild harvest in more than a decade. While that may indicate the bay's oysters can rebound naturally, Naylor cautioned it's a fragile and limited recovery. Oysters aren't dying as much from Dermo and MSX, the two diseases that have devastated them since the 1980s. But prior infections that appeared in retreat have flared up again and undercut revivals, he noted. Harris Creek faces the same threat, the DNR official said, which is why the restoration effort is a gamble. But if the project can establish a dense enough crop of oysters on its rebuilt reefs, officials hope that will provide some insurance against setbacks. And a University of Maryland study suggests the project could bear fruit elsewhere, with larvae spawned in the creek carried by currents to other areas of the bay. "We know it works," Naylor said of planting oysters. "The question is, does it persist, and is the long-term population that results worth the significant amount of money we've invested?" The bay stands to benefit in a number of ways. Oyster reefs serve as magnets for marine life, including rockfish and crabs. A study indicates restored reefs help clean up the bay's degraded water, too. Researchers with the Virginia Institute of Marine Science and UM Center for Environmental Science found that oysters and the other creatures drawn to their reefs — mussels, barnacles and worms — remove significant amounts of nitrogen from the water, which otherwise might feed the algae blooms and oxygen-starved dead zone that form every summer in the bay. Lisa Kellogg, an ecologist at VIMS and the study's lead author, cautioned that restoring oysters, even to unrealistic historic levels, would be no panacea for the bay's pollution woes. Cleanup is still needed of sewage disposal and farm and urban runoff, she said. "This is not a substitute for all those other activities that are going on in the watershed, but it's a supplement," agreed co-author Jeff Cornwell, a biogeochemist at UM's Horn Point laboratory. "If we could get this to a viable, self-sustaining population, it could make a dent in water quality, there's no question."

NEWPORT NEWS DAILY PRESS

Oysters show talent for filtering nitrogen from water

Filter-feeding oysters have long been prized for their natural ability to turn murky waters clear. But new research indicates the bivalves also have a particular ability to remove nitrogen from water, which could make them valuable partners in ongoing efforts to restore the Chesapeake Bay. Researcher Lisa Kellogg at the Virginia Institute of Marine Science, or VIMS, published the findings in this month's issue of the Marine Ecology Progress Series. For the study, Kellogg and her team attempted to quantify whether restored oyster reefs can remove harmful nutrients that wash into the bay and its tributaries from fertilized lawns and farmland, wastewater treatment plants, stormwater drains and septic tanks. "Our study showed that a successfully restored oyster reef can remove significant levels of nutrients from the water column," Kellogg says. According to VIMS, based in Gloucester Point, researchers working on the Choptank River in Maryland measured flows of nitrogen and phosphorus in a restored oyster reef containing 131 large oysters per square meter with a neighboring site that was unrestored. They found that the restored reef can remove up to 10 times more nitrogen than the unrestored site. Nitrogen was taken up into the soft tissues and shells of the oysters and other organisms such as mussels, clams, barnacles and worms teeming in the restored reef habitat. But the shells of live oysters and mussels accounted for nearly half of all the nitrogen uptake — a finding Kellogg calls significant. "The shells of oysters and mussels can persist long after the organisms die," Kellogg said, "removing nutrients from the water for years, decades or even centuries if the shells become buried." More research is needed to determine if similar results are possible in areas of the bay that have different environmental conditions. But researchers emphasized that oyster reefs are no substitute for reducing nutrient runoff, as there aren't enough of them to remove enough nutrients to meet the river's new nitrogen restrictions imposed by the U.S. Environmental Protection Agency as part of long-term federal and state cleanup efforts. Co-authors of the study, "Denitrification and nutrient assimilation on a restored oyster reef," are Jeff Cornwell, Michael Owens and Ken Paynter of the University of Maryland Center for Environmental Science.

ASSOCIATED PRESS (W. VA.)

Grants can help landowners create habitat in state

West Virginia landowners who want to apply for grants to improve wildlife habitat have until June 14 to contact the

Natural Resources Conservation Service. The agency is currently considering projects for Wildlife Habitat Incentive Program, funded by the federal farm bill. They'll be ranked and considered for funding in July. West Virginia State Conservationist Greg Kist says the program funds activities that increase food, shelter and nesting habitats for various species. Landowners can create habitat by cutting back woodland borders, fencing sensitive areas, restoring streams and planting warm season grasses, among other things. Species targeted for help include the cottontail rabbit, grouse, mussels, trout and various songbirds, including the Golden Winged Warbler in West Virginia.

GREENWIRE

SEQUESTRATION: EPA employee -- a self-described 'grunt' -- speaks out

So far, Elizabeth Lytle has lost $452 due to sequestration. After next Friday's third mandatory furlough day for U.S. EPA employees, she'll be out another $226. And by the end of September, her take-home pay after taxes will be down more than $2,000. It's a tough hit for someone whose total pay comes to about $52,000, Lytle said in an interview this week. It probably means she and her husband, who can only work part time due to health problems, will be putting off some needed dental work. Lytle said she needs two root canals, but dental work is expensive. "You have to judge, can I live with the pain, or fork over that money?" she said. And Lytle, 54, knows pain. The former storekeeper in the Navy Reserve said she's spent the last decade dealing with effects of the cancer that took her thyroid. Lytle is an administrative program assistant in the EPA Region 5 Acquisition and Assistance Branch in Chicago. She's also an EPA union member with the American Federation of Government Employees. She decided to speak out this week about her health issues and sequestration's impact on her family's financial situation because she believes Congress needs to hear from the "low man on the totem pole" about the hardships federal employees are facing. "Definitely more government workers need to be explaining to the public and Congress what's happening," Lytle said. "A lot of people are scared to death to speak out, they are afraid for their jobs. [But] the only way people are going to understand what is happening is if they hear what sacrifices we are having to do." The across-the-board spending cuts imposed by sequestration require EPA to shave more than $425 million from its budget. To minimize furloughs, EPA officials have focused on cutting grants, contracts, travel and other administrative costs.That strategy has had some success. Last month, acting Administrator Bob Perciasepe announced that rather than the 14 furlough days originally planned, EPA employees would instead be forced to take 79 hours of unpaid leave, or less than 10 days. But EPA has also recently begun filling some long-vacant positions, prompting AFGE officials to demand that the agency cease all hiring and use any savings to avoid furloughs as much as possible. EPA officials have said they are trying to ease the workload of an already overburdened staff (*Greenwire*, May 6). The first phase of the agency's furlough plan includes four mandatory furlough days by mid-June with the third of those days set for next Friday. When next week's furlough day hits, you won't find Lytle watching television at her home in Waukegan, Ill. The GS-8 level employee who has worked at EPA for nearly eight years got rid of the television during the first year of the now three-year federal pay freeze in order to save money. Since then, she's also gotten rid of the land line for her telephone -- though she keeps the Internet cable because she needs it for work. Not that work is a happy place these days for Lytle and 40 or so others who work in her office. "Morale in our building is so low that it's pathetic," Lytle said. **'They want to get rid of the EPA'** Even before sequestration, Lytle considered leaving the federal government. She has kept her eyes open for opportunities. But even after going back to school recently for a bachelor's in environmental policy, she hasn't found much. Lytle doesn't blame her immediate supervisors for the current state of affairs at her office. "In my branch, I see a lot of your branch chiefs and division directors doing everything they can to help the workers," she said. She's more skeptical about how much the senior management at EPA cares about the plight of agency "grunts" like herself. Not all EPA staff are subject to furloughs. Some presidential appointees who are not subject to federal leave policies don't have to take furlough days. Perciasepe isn't subject to the furlough, but as a way to show solidarity with his employees, the acting administrator has donated 32 hours of pay to a fund to help federal workers. According to an EPA spokeswoman this week, other members of the senior staff who are not subject to the furlough have done the same. But Lytle aims most of her anger at Congress. "The one who is at fault here, in my mind, is the actual Congress," she said. "The president has done what he can do. ... He's got a Congress that really doesn't care about the environment. They want to get rid of the EPA. ... They'll do it any way they can." She also thinks it's unfair that after the one-two punch of the pay freeze and efforts to boost government workers' retirement contribution amounts, federal employees were asked to bear the brunt of sequestration. AFGE estimates the savings derived from the pay freeze and retirement alterations have already saved the federal government more than $100 billion over the next decade. The union believes government contractors and the general public should be asked to do more to share the pain of sequestration's cuts. "We're carrying the lion's share," Lytle said. "It takes

everybody to be on board." But she doesn't have a whole lot of time to hope for change in Washington, D.C. She's trying to plan the rest of her furlough days through the end of the fiscal year.